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# Masked GANs for Face Completion: A Novel Deep Learning Approach

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## Abstract

INTRODUCTION: Recent deep learning based image editing methods have achieved promising results for removing object in an image but fail to generate appreciable performance for removing large objects of complex nature, especially mask from facial images. Towards this goal the objective of this work is to remove mask objects in facial images. In this study, authors propose a novel approach for face completion using Generative Adversarial Networks (GANs) that utilize masked data. This technology can help in image restoration and preservation, thus enabling us to cherish those memories that are held dear to our hearts.
OBJECTIVES: Train a GAN to learn the mapping from incomplete to complete face images by utilizing a masked input image.
METHODS: The discriminator is trained to distinguish between face images and full ground truth images. Our results indicate that our technique generates high-quality, realistic facial images that are visually comparable to the ground truth and that it can generalise to new faces that were not encountered during training.
RESULTS: Our findings indicate that GANs with masked inputs are a good approach for generating whole face images from partial or masked data.
CONCLUSION: Our experimental findings show that our method produces facial images of great quality and realism that are visually equivalent to the actual thing. Our proposed approach can also be applied to fresh faces that weren't seen. The performance can still be improved further using larger dataset. Also, further investigation into adversial attacks may help in improving performance. This technology can be further utilized for developing realtime mask removal software as well.

**Keywords:** Generative Adversarial Networks, masked data, face images

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## 1. Introduction

The COVID-19 pandemic [1] has affected our lives in countless ways, including the way the world interacts, and the way people commemorate our essential moments. Wearing masks became an absolute necessity and slowly incorporated into our daily social norms. While face mask has become a fashion for some, it was a nuisance for others. Especially for many, the major regrets might be that their special photos taken during the pandemic era were taken with face masks. While masks were necessary to protect ourselves and others from the spread of COVID-19, they made it difficult to capture the essence and emotions of those special moments.

The purpose of the paper is to remove masks from these photos, as realistically as possible, thereby restoring the visual memories of the special moments. Our aim of this paper is to use the Generative Deep Learning model [2] to

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